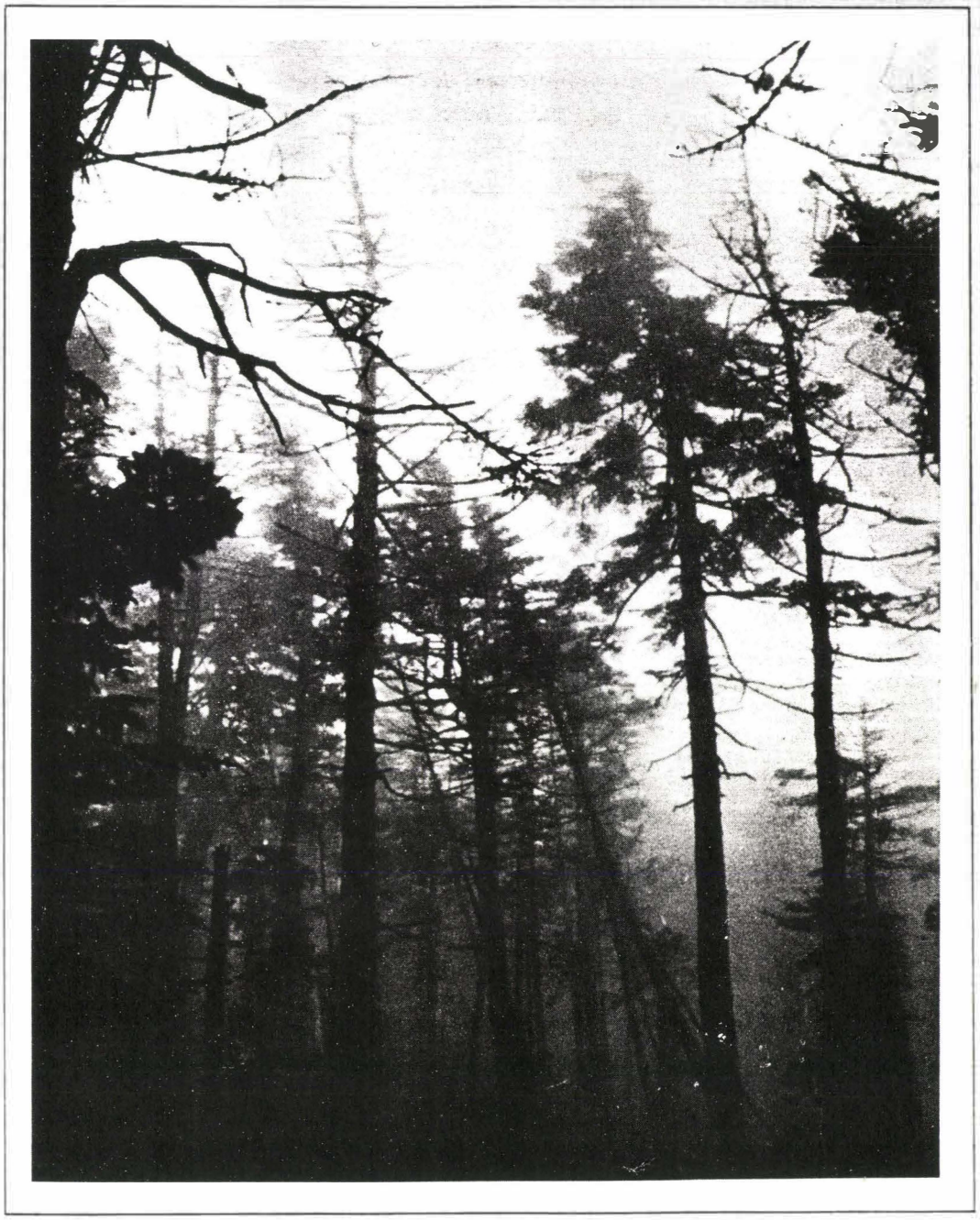
United States
Department of
Agriculture

Forest
Service

**Forest
Pest
Management**

Washington, D.C.

Forest Insect and Disease Conditions in the United States 1985



Gypsy Moth

In 1985, the gypsy moth (Lymantria dispar) defoliated 1.7 million acres in the generally infested area of the Eastern United States. Defoliation is predicted to increase again in 1986.

Gypsy moth populations continue to spread south and west. The "front line" of the generally infested area now passes through Virginia, West Virginia, and the Pennsylvania-Ohio border. Parts of the lower peninsula of Michigan are also generally infested. In 1985, Michigan, Virginia, and West Virginia--States with relatively new general infestations--had rapid increases in defoliation.

In Virginia, the front line of the infested area runs through the northern half of Accomack County and extends westward across the Chesapeake Bay to include Stafford County through the

Acres of aerially detected defoliation caused by the gypsy moth in the Eastern United States

State	1984	1985
Connecticut	544	89,544
Delaware	14,203	5,144
Maine	1,892	6,698
Maryland	41,824	83,488
Massachusetts	185,520	414,084
Michigan	6,425	18,460
New Hampshire	0	0
New Jersey	98,695	239,350
New York	33,678	129,820
Pennsylvania	444,900	581,113
Rhode Island	164,600	133,920
Vermont	0	0
Virginia	374	5,200
West Virginia	0	2,470
Total	992,655	1,709,291

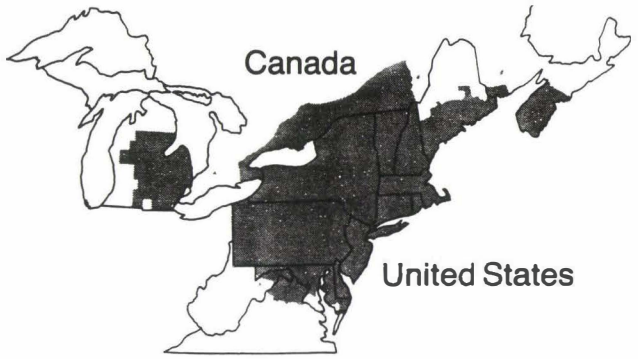
1985 Gypsy Moth Defoliation

northern half of Madison County and west into Page, Clarke, and Frederick Counties

In West Virginia, the line continues through Hampshire, Mineral, and part of Grant Counties; and then into Garrett County, MD, and along the Pennsylvania-Ohio border.

In central Michigan, the generally infested area is bordered by Iosco, Ogemaw, Roscommon, Missaukee, Osceola, Newaygo, Montcalm, Ionia, Eaton, Calhoun, Branch, Jackson, Lenawee, Monroe, Wayne, Macomb, St. Clair, Sanilac, Huron, Tuscola, Bay, and Arenac Counties.

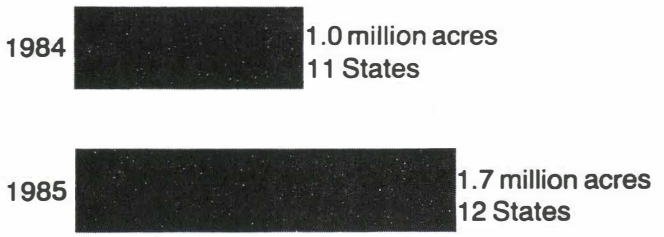
Gypsy Moth: Generally Infested Area in 1985



Outside the generally infested area, 17 isolated infestations were present in 9 States during 1985. States with isolated infestations are Illinois, Indiana, Minnesota, North Carolina, Ohio, Oregon, Tennessee, Washington, and Wisconsin.

In Oregon, gypsy moth populations in the large, 225,000-acre infestation near Eugene were greatly reduced with insecticide treatments.

Acres Defoliated by Gypsy Moth



Southern Pine Beetle

Southern pine beetle (Dendroctonus frontalis) activity increased dramatically in 1985. More than 50,000 infestation spots were reported throughout the South, and 72 counties were classed as "outbreak counties"; that is, counties with one or more multiple-tree spots per 1,000 acres.

Louisiana and Texas had their worst-ever southern pine beetle year. In Louisiana, the National Guard was activated to help private landowners in their control efforts, and beetle activity remained at a high level all year. Late in the year, however, beetle activity declined in east Texas.

Elsewhere, Alabama, Arkansas, Georgia, Mississippi, and South Carolina experienced increasing beetle problems.

Southern pine beetle outbreak counties

Alabama: Barbour, Bullock, Chambers, Chilton, Choctaw, Clarke, Crenshaw, Cullman, Fayette, Greene, Hale, Lamar, Lawrence, Lowndes, Macon, Marion, Monroe, Perry, Russell, Tuscaloosa, Winston

Arkansas: Columbia, Union

Georgia: Baldwin, Bibb, Chattahoochee, Jasper, Jones, Putnam, Stewart, Troup, Upson

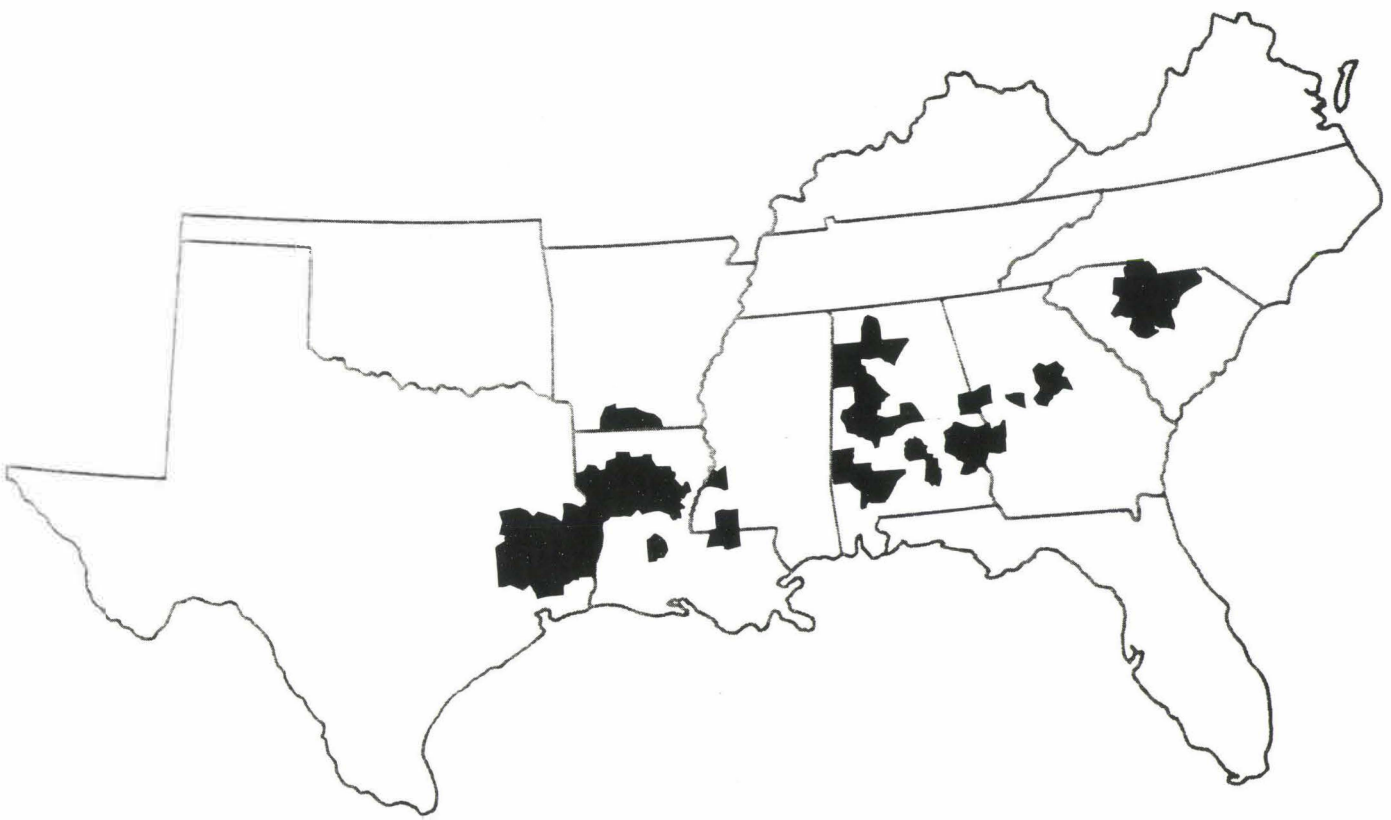
Louisiana: Bienville, Caldwell, Catahoula, De Soto, East Feliciana, Evangeline, Grant, Jackson, La Salle, Natchitoches, Red River, Sabine, St. Helena, Winn

Mississippi: Amite, Claiborne

South Carolina: Chester, Chesterfield, Fairfield, Kershaw, Lancaster, Lexington, Newberry, Richland, Union, York

Texas: Angelina, Hardin, Houston, Jasper, Liberty, Montgomery, Newton, Polk, Sabine, San Augustine, San Jacinto, Trinity, Tyler, Walker

1985 Southern Pine Beetle Outbreak Counties



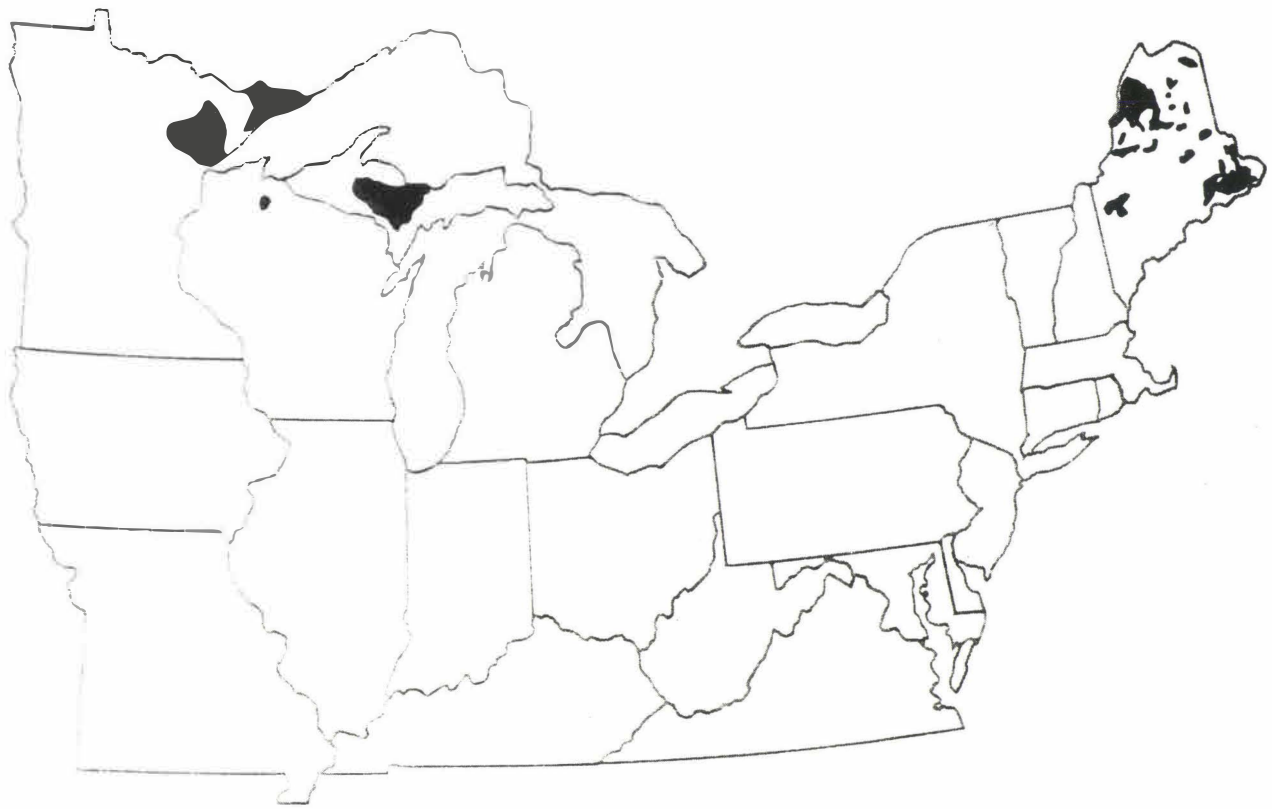
Spruce Budworm

The spruce budworm (Choristoneura fumiferana) defoliated 5.2 million acres in 1985. This continued the general downward trend that began in 1984. Even the Lake States, which had increased defoliation in 1984, reported decreases in 1985. Only New York, which had 275 acres of light defoliation, reported an increase. The downward trend is expected to continue in 1986.

Acres of aerially detected defoliation caused by the spruce budworm in the Eastern United States

State	1984	1985
Maine	5,500,000	4,800,000
Michigan	192,394	93,810
Minnesota	361,600	307,273
New Hampshire	930	0
New York	0	275
Vermont	0	0
Wisconsin	22,050	15,000
Total	6,076,974	5,216,358

1985 Spruce Budworm Defoliation



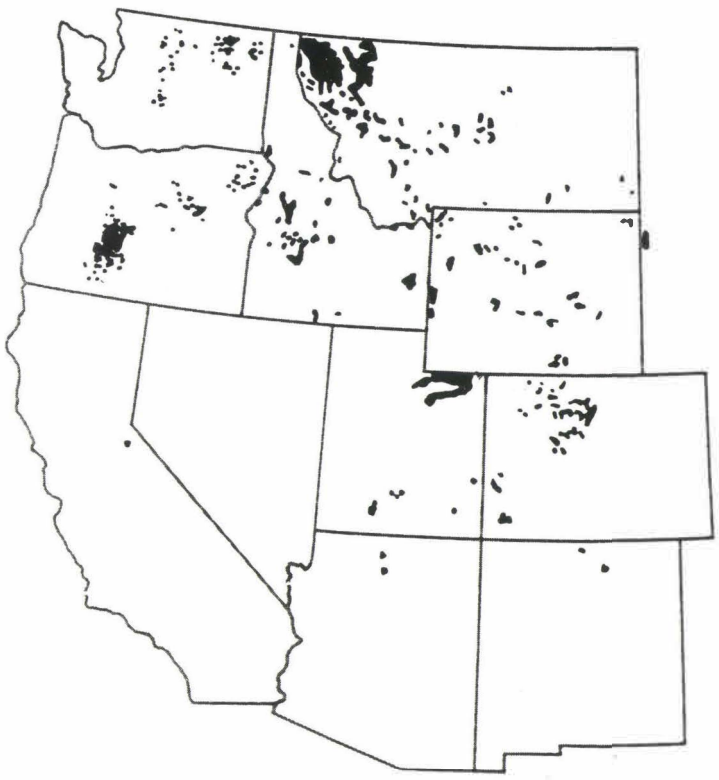
Mountain Pine Beetle

In 1985, mountain pine beetle (Dendroctonus ponderosae) activity remained high. Outbreaks, which covered 3.6 million acres in 1983 and 3.3 million acres in 1984, occurred on 3.34 million acres in 1985.

Acres of lodgepole, ponderosa, and other pines with mountain pine beetle infestations were as follows:

Northern Region	
Montana	933,000
Northern Idaho	8,000
Total	941,000
Rocky Mountain Region	
Colorado	260,000
Eastern Wyoming	104,000
South Dakota	7,000
Total	371,000
Southwestern Region	
Arizona	100
New Mexico	900
Total	1,000
Intermountain Region	
Southern Idaho	19,000
Utah	477,000
Western Wyoming	11,000
Total	507,000
Pacific Southwest Region	
California	20,000
Total	20,000
Pacific Northwest Region	
Oregon	1,400,000
Washington	100,000
Total	1,500,000

1985 Mountain Pine Beetle Outbreak Areas



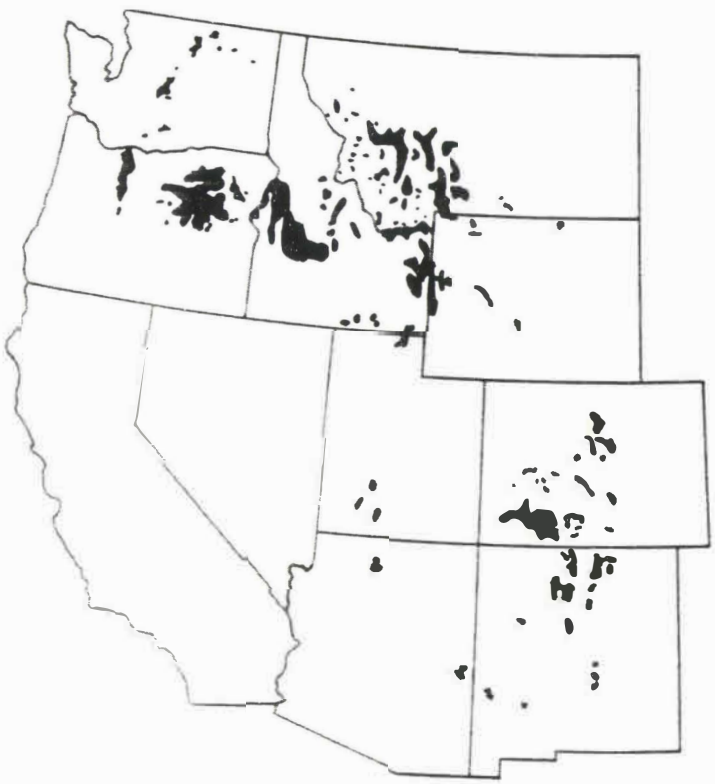
Western Spruce Budworm

In 1985, western spruce budworm (Choristoneura occidentalis) defoliation increased to a record 12.8 million acres. The Pacific Northwest Region reported an especially large increase. In the Northern Region, defoliation topped the 2-million-acre mark for the fourth year in a row.

The acres of aerially detected defoliation attributed to the budworm in each Region and State follow:

Northern Region	
Montana	2,675,000
Northern Idaho	11,000
Total	2,686,000
Rocky Mountain Region	
Colorado	1,567,000
Eastern Wyoming	22,000
Total	1,589,000
Southwestern Region	
Arizona	102,640
New Mexico	529,484
Total	632,124
Intermountain Region	
Southern Idaho	2,620,300
Utah	87,600
Western Wyoming	198,500
Total	2,906,400
Pacific Southwest Region	
California	0
Total	0
Pacific Northwest Region	
Oregon	4,567,390
Washington	415,290
Total	4,982,680

1985 Western Spruce Budworm Defoliation



Disease Conditions in the East

In the South, fusiform rust (Cronartium quercuum f. sp. fusiforme) severely damages southern pine forests. Estimates derived from the most current Forest Inventory and Analysis data indicate that considerable fusiform rust infection occurs on over 15 million acres of slash and loblolly pines. In 1984, about 14.9 million acres were infected. In 1985, the estimates were revised for three States: Florida, South Carolina, and Virginia. As a result, the estimate of total acreage infected increased to 15.3 million acres.

At least 10 percent of the trees on these 15.3 million acres have potentially lethal fusiform rust infections either on or within 12 inches of their main stems.

In 1981, a systematic procedure for predicting fusiform losses was established. The system uses the most recent Forest Inventory and Analysis data, growth and yield formulas, and other mathematical equations to estimate dollar losses. This loss assessment procedure has been used in Florida, Georgia, North Carolina, South Carolina, and Virginia.

In these States, losses due to fusiform rust had been calculated at $31 million per year. However, when the estimates of infected acreage were revised in Florida, South Carolina, and Virginia during 1985, the total monetary

Acres of slash and loblolly pine stands infected with fusiform rust. About 10 percent or more of the trees are infected on their main stems or within 12 inches of their main stems--1985 *

State	Landownership class				Total by State
	National Forest	Other Federal	State	Private	
Alabama	61,900	20,100	20,100	1,938,900	2,041,000
Arkansas	6,500	1,200	800	50,400	58,900
Florida	6,210	10,856	25,159	1,006,814	1,049,039
Georgia	37,328	139,619	36,170	5,083,927	5,297,044
Louisiana	61,300	15,700	31,400	1,461,700	1,570,100
Mississippi	86,500	6,700	6,800	1,585,200	1,685,200
North Carolina	3,854	8,716	25,769	1,100,716	1,139,055
South Carolina	73,081	60,093	35,937	1,700,040	1,869,151
Texas	36,500	1,300	1,400	461,800	501,000
Virginia	0	0	0	45,516	45,516
Total	373,173	264,284	183,535	14,435,013	15,256,005

* This 1985 table contains revised estimates for Florida, South Carolina, and Virginia.

Losses in loblolly and slash pines attributable to fusiform rust in 1985 *

State	Mortality (cordwood)		Quality loss (sawtimber)		Total
	Loblolly	Slash	Loblolly	Slash	
			1,000 dollars		
Florida	823	490	340	1,130	2,783
Georgia	8,728	3,778	7,980	3,200	23,686
North Carolina	3,107	0	116	0	3,223
South Carolina	3,464	227	1,751	49	5,491
Virginia	0	0	44	0	44
Total	16,122	4,495	10,231	4,379	35,227

* Values are stated in present value terms, discounted at 4 percent.

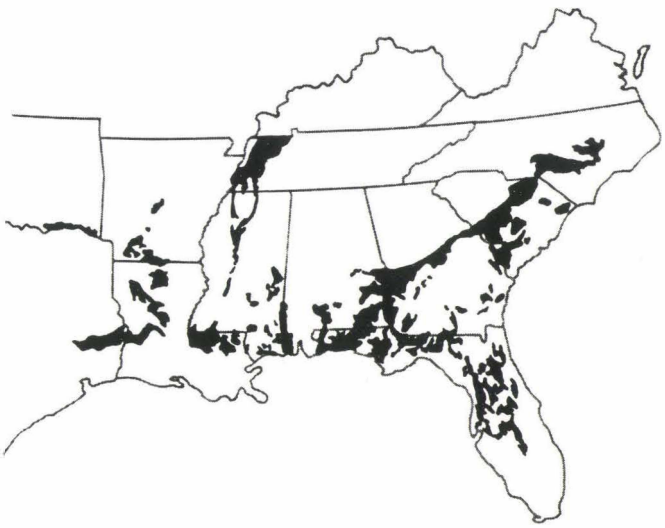
loss estimate was also revised. The losses due to fusiform rust in these five States increased to $35 million.

Annosus root disease (Heterobasidion annosum) remains a serious problem in the South. Disease hazard is greatest on deep, sandy soils with good internal drainage. On these high-hazard soils, which occur on about 20 percent of the South's land base, mortality is the normal result of infection.

Decline and mortality of several tree species were reported again this year, especially decline and mortality of oak in the South and of ash, beech, birch, fir, larch, maple, oak, and spruce in the Northeast. Environmental stress, coupled with pest activity, appears to be contributing to many of the reported tree decline problems. The possible effects of man-caused stress, such as atmospheric deposition, are also being investigated.

High-Hazard Soils

Pines growing in these areas are normally killed if they become infected with annosus root disease.



Disease Conditions in the West

In the West, root diseases and dwarf mistletoes (Arceuthobium spp.) were the most damaging diseases. Other important conifer diseases included foliage diseases, whose incidence was down; stem rust diseases, of which white pine blister rust has the greatest timber management implications; and stem decay, which continued to cause considerable damage in old-growth conifer stands.

Average annual losses caused by dwarf mistletoes

Region/State	Area infested	Volume lost
	1,000 acres	1,000 cubic feet
Northern Region		
Montana	2,416	33,250
Northern Idaho	713	13,420
Rocky Mountain Region *		
Colorado	638	5,800
Eastern Wyoming	361	4,960
Southwestern Region *		
Arizona	982	8,140
New Mexico	1,793	16,570
Intermountain Region		
Southern Idaho	2,511	28,860
Utah	461	4,750
Nevada	62	580
Western Wyoming	276	3,290
Pacific Southwest Region		
California	2,200	120,000
Pacific Northwest Region		
Oregon	4,885	76,560
Washington	3,575	55,440
Alaska Region	1,500	11,000
Total	22,373	382,620

* National Forest System lands only.

Average annual root disease-caused mortality

Region	Area affected *	Mortality by landownership		Total Volume
		National Forest	Other	
	1,000 acres	1,000 cubic feet		
Northern Region	3,300	54,400	26,300	80,700
Rocky Mountain Region	38	127 **	NA ***	127
Southwestern Region	1,140	2,900	1,860	4,760
Intermountain Region	56	1,400	215	1,615
Pacific Southwest Region	8,133	12,298	7,100	19,398
Pacific Northwest Region	2,220	51,453	80,478	131,931
Total	14,887	122,578	115,953	238,531

* Area where root diseases are a management concern.
** A partial estimate for one forest type only.
*** NA = data not available.

Southern Region—Insects

Southern Region—Status of insects in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands

Insect	Host	Location	Remarks
Bagworm *Thyridopteryx ephemeraeformis*	Eastern redcedar, loblolly pine, Virginia pine, white pine	Georgia, North Carolina, South Carolina, Tennessee, Virginia	High populations and widespread defoliation in localized areas.
Balsam woolly adelgid *Adelges piceae*	Fraser fir	North Carolina, Tennessee, Virginia	Continued to cause significant mortality throughout the range of Fraser fir in the southern Appalachians, except on Mt. Rogers, Virginia. However, the outbreak has spread throughout Cabin Ridge and Wilburn Ridge in the Mt. Rogers National Recreation Area.
Black turpentine beetle *Dendroctonus terebrans*	Southern pines	Regionwide	Drought stress and late spring wildfires predisposed many forest stands to moderate losses.
Coneworms *Dioryctria amatella* *Dioryctria clarioralis* *Dioryctria disclusa* *Dioryctria merkeli*	Loblolly pine	Regionwide	Populations of *D. disclusa* and *D. merkeli* continued to increase across the South as evidenced by pheromone trap catches. Despite the increasing *D. disclusa* populations, losses caused by this species have been minimized with accurately timed pesticide applications. Certain treated orchards sustained significant losses caused by *D. merkeli*. Losses of over 3,000 bushels of cones have been reported from individual orchards. *D. amatella* and *D. clarioralis* continued to cause low to moderate damage across the South.
Eastern tent caterpillar *Malacosoma americanum*	Black cherry, other Rosaceae	Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia	High population levels and widespread defoliation of individual trees throughout each State.

Southern Region—Status of insects in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Insect	Host	Location	Remarks
Fall webworm *Hyphantria cunea*	Various hardwoods	Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia	Populations continued at high levels. Widespread defoliation reported in late summer.
Forest tent caterpillar *Malacosoma disstria*	Tupelo gum, other hardwoods	Alabama, Louisiana, North Carolina, South Carolina	Moderate to heavy defoliation in localized areas of the coastal area of North and South Carolina. Partial to complete defoliation occurred on 441,000 acres in south Louisiana.
Fruittree leafroller *Archips argyrospila*	Baldcypress	Louisiana	Noticeable defoliation (entire crowns turn red) was restricted to 15,000 acres in Atchafalaya Basin. Light defoliation on an additional 40,000 acres.
Grasshoppers *Melanoplus* sp.	Dogwood, red oak, hickory	Tennessee	Localized heavy defoliation in Cumberland County.
Gypsy moth *Lymantria dispar*	Various hardwoods	North Carolina, South Carolina, Tennessee, Virginia	The northern tier of counties in Virginia were generally infested. The quarantine line has been extended to the south and now includes the northern half of Madison County east to Stafford County west to Page County and the northern one-fourth of Accomack County. Defoliation in Virginia this year amounted to 5,200 acres. Isolated infestations are present in all four States.
Hickory bark beetle *Scolytus quadrispinosus*	Hickory	Tennessee	Combined with hickory decline, the hickory bark beetle caused scattered tree mortality in middle and east Tennessee.
Introduced pine sawfly *Diprion similis*	Eastern white pine	North Carolina, Tennessee, Virginia	Populations continued at low levels in all three States.
Larch sawfly *Pristiphora erichsonii*	Larch	North Carolina	Populations continued at low levels, causing light defoliation on a few trees in Buncombe County.

Southern Region—Status of insects in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Insect	Host	Location	Remarks
Loblolly pine sawfly *Neodiprion taedae linearis*	Loblolly pine	Arkansas, Louisiana, Mississippi, Tennessee, Virginia	Moderate defoliation occurred in the western-middle part of Tennessee; light defoliation in localized areas of Virginia. Populations reduced in Louisiana and Arkansas. In Mississippi, scattered defoliation occurred over 87,000 acres in Copiah, Hines, Rankin, and Simpson Counties.
Locust leafminer *Odontota dorsalis*	Black locust	Kentucky, North Carolina, Tennessee, Virginia	Scattered moderate to heavy defoliation.
Looper complex Linden looper *Erannis tiliaria* Eastern oak looper *Phigalia titea* Fall cankerworm *Alsophila pometaria*	Oaks	Virginia	Populations were at very low levels, with only localized areas of light defoliation.
Maple petiole borer *Caulocampus acericaulis*	Sugar maple	Tennessee	In many parts of Davidson County, the wind severed the bored-out leaf petioles, and trees were prematurely defoliated.
Nantucket pine tip moth *Rhyacionia frustrana*	Loblolly pine, shortleaf pine, Virginia pine	Regionwide	Moderate populations occurred throughout all States. Some severe damage was observed in Virginia pine Christmas tree plantations.
Periodical cicada *Magicicada septendecim*	Various hardwoods	Arkansas, North Carolina, Tennessee	Caused localized severe flagging of various hardwood trees.
Pine colaspis *Colaspis pini*	Loblolly pine	Mississippi	Losses reported in pine regeneration in Copiah County.
Pine engravers *Ips* spp.	Southern pines	Regionwide	Activity locally high in drought-stressed areas. High levels of mortality also occurred where the trees were severely stressed by wildfire. Tree mortality due to *Ips* was also present in seed orchards in Florida and North Carolina.

Southern Region—Status of insects in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Insect	Host	Location	Remarks
Pine leaf adelgid *Pineus pinifoliae*	Red spruce, white pine	North Carolina	Galls found on spruce, the alternate host, and flagging of white pine branches occurred in the summer. Damage to white pine heavy where alternate host present.
Pine webworm *Tetralopha robustella*	Loblolly pine, shortleaf pine	Arkansas	Populations increased in 1-year-old pine plantations.
Reproduction weevils Pales weevil *Hylobius pales* Pitch-eating weevil *Pachylobius picivorus*	Southern pines	Arkansas, Florida, North Carolina	Losses reported in regeneration areas in southwest Arkansas, Florida, and in Davidson County, NC.
Scales *Toumeyella* spp.	Southern pines	Regionwide	The sporadic outbreaks of tortoise scales declined, but these species continued to cause damage to shortleaf pine orchards.
Pseudophilippia quaintancii	Southern pines	Alabama	Outbreaks have declined in the Southeast. Only one seed orchard in southern Alabama reported significant population levels.
Seedbugs *Leptoglossus corculus* *Tetyra bipunctata*	Southern pines	Florida, North Carolina, South Carolina	Moderate populations caused scattered seed losses.
Slash pine thrips *Gnophothrips fuscus*	Slash pine	Florida	Minimal seed and cone losses reported.
Southern pine beetle *Dendroctonus frontalis*	Southern pines	Regionwide	This was a record year for activity in Texas and Louisiana. Texas had 16,600 infestations or spots, but by late 1985, beetle activity seemed to drop off. Louisiana reported 22,000 spots. The epidemic seemed to be moving east. Activity increased in Alabama (1,772 spots), Arkansas (435 spots), Georgia (744 spots), Mississippi (5,606 spots), and South Carolina (2,760 spots). North Carolina also reported 400 spots. Even Florida had southern pine beetle activity and reported 11 spots.

Southern Region—Status of insects in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Insect	Host	Location	Remarks
Texas leafcutting ant *Atta texana*	Southern pines	Louisiana, Texas	Serious losses continued in pine plantations on deep sandy soils.
Twolined chestnut borer *Agrilus bilineatus*	Oaks	Kentucky, Tennessee	Activity was found in declining oak stands scattered throughout Kentucky and in middle and east Tennessee.
Variable oakleaf caterpillar *Heterocampa manteo*	Oak	Mississippi	Localized defoliation in Itawamba County.
Walkingstick *Diapheromera femorata*	Oaks	Oklahoma	Localized defoliation in Le Flore County.
Whitemarked tussock moth *Orgyia leucostigma*	Laurel oak, live oak, southern red oak, water oak, various ornamentals	North Carolina, South Carolina	Caused scattered, localized problems in coastal areas.
White pine aphid *Cinara strobi*	Eastern white pine	North Carolina, Virginia	Locally heavy populations caused branch dieback.
White pine cone beetle *Conophthorus coniperda*	Eastern white pine	North Carolina, Tennessee, Virginia	Increased activity, with damage ranging from 40 to 100 percent. Large population buildup expected for 1986.
White pine weevil *Pissodes strobi*	Eastern white pine	Tennessee	Beginning to be a problem in Christmas tree plantations in northeastern Tennessee.
Yellow-poplar weevil *Odontopus calceatus*	Yellow-poplar	Tennessee	Leaf browning and defoliation of yellow-poplars occurred in Anderson, Campbell, Knox, Overton, and Union Counties. Yellow-poplar scattered over 40,000 acres were more than 50 percent defoliated.

Southern Region—Diseases

Southern Region—Status of diseases in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands

Disease	Host	Location	Remarks
STEM AND BRANCH DISEASES			
Canker rot *Inonotus hispidus* *Strumella coryneoidea*	Oaks	Alabama, Georgia, Mississippi, North Carolina	Is a serious problem in localized areas.
Chestnut blight *Cryphonectria parasitica* (=*Endothia parasitica*)	Native chestnuts, exotic chestnuts	Throughout host ranges	Damage continued, as did research efforts into reducing the virulence of the disease-causing organism.
Fusiform rust *Cronartium quercuum* f. sp. *fusiforme*	Loblolly pine, slash pine	Regionwide, except Kentucky, Puerto Rico, Tennessee, Virgin Islands	Continued as the most serious disease of southern pines. Fusiform rust stem infections occur on at least 10 percent of the pines growing on about 15 million acres. Annual losses in FLorida, Georgia, North Carolina, South Carolina, and Virginia are estimated at $35.2 million.
Hypoxylon canker *Hypoxylon atropunctatum*	Oaks	Regionwide	Common on stressed or weakened trees in low-quality forest sites and urban environments.
Nectria canker *Nectria* sp.	Black walnut, yellow-poplar	Kentucky, Tennessee	Common on selected sites, causing serious degrade losses.
Pitch canker *Fusarium moniliforme* var. *subglutinans*	Southern pines, especially loblolly and slash pines	Alabama, Arkansas, Florida, Louisiana, Mississippi, North Carolina	Endemic in slash pine plantations in Florida and in loblolly pine plantations on peat soils in eastern North Carolina.
Slime flux *Erwinia* spp. and other bacteria	Oaks	Kentucky, North Carolina, South Carolina, Tennessee	Unusually high incidence following the 1984 December freeze.
Stem canker *Fusarium solani*	Teak	Puerto Rico, Virgin Islands	Ubiquitous in plantations. Incidence averaged 25 percent of the stems. Considerable lumber degrade results because termites infest the cankers.

Southern Region—Status of diseases in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Disease	Host	Location	Remarks
Stem decay Basidiomycetes	All species, especially hardwoods	Regionwide	Continued as a serious problem. More common in fire-damaged stands.
White pine blister rust *Cronartium ribicola*	Eastern white pine	North Carolina, Virginia	Found above 3,000 feet and was only serious in localized areas
ROOT DISEASES			
Annosus root disease *Heterobasidion annosum*	Cedar, southern pines	Regionwide	Annosus was the most serious root disease in the South. Damage reported in thinned stands in Alabama, Florida, Louisiana, Mississippi, North Carolina, and South Carolina. Current surveys show the disease may cause a major growth loss, as well as mortality on high-hazard sites. Disease hazard soils occur on about 20 percent of the South's land base.
Littleleaf disease complex of site factors, *Phytophthora cinnamomi*, and *Pythium* spp.	Loblolly pine, shortleaf pine	Alabama, Georgia, Kentucky, North Carolina, South Carolina, Tennessee	Worst in Piedmont in natural stands growing on eroded, heavy clay soils. Surveys show considerable growth loss on older loblolly pines growing on high-risk sites. Low incidence elsewhere throughout the South.
Root decay *Armillaria* spp. *Inonotus circinatus* *Phaeolus schweinitzii* *Ganoderma lucidum*	Most conifers, hardwoods	Regionwide	Common in forest stands and urban environments, especially where stresses are severe or trees overmature. *Ganoderma lucidum* reported on mahogany in Florida for the first time.
Root decline *Verticicladiella procera*	Eastern white pine, loblolly pine	Georgia, North Carolina, Tennessee, Virginia	In North Carolina, disease may be causing top dieback in loblolly plantations. Losses continued in white pine stands in the southern Appalachians. Disease appeared more common on stressed trees. Was a serious problem in Christmas tree plantations.

Southern Region—Status of diseases in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Disease	Host	Location	Remarks
FOLIAGE DISEASES			
Actinopelte leaf spot *Actinopelte dryina*	Oak	Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia	Caused leaf spots and premature leaf drop. Probably associated with drought.
Anthracnose *Gnomonia* sp. *Discula* sp. (=*Gloeosporium* sp.) *Kabatiella* sp. (=*Gloeosporium* sp.) *Apiognomonia* sp. (=*Gnomoni* sp.)	Hardwoods, especially ash, dogwood, maple, sycamore, and walnut	Regionwide	Premature defoliation and shoot dieback may result. Incidence high again this year because of wet spring, but impact was low.
Brown spot *Mycosphaerella dearnessii* (=*Scirrhia acicola*)	Longleaf pine	Throughout host range	Severe locally, but can be controlled by prescribed fire and genetic resistance.
Conifer-aspen rust *Melampsora medusae*	Poplars	Throughout host range	Caused minor damage to mature trees in localized areas.
Dothistroma needle blight *Mycosphaerella pini* [*Dothistroma septospora* (=*Dothistroma pini*)]	Austrian pine	Oklahoma	Still common in urban areas and shelterbelts. Primarily esthetic damage.
Needle casts of pine *Lophodermium* spp. *Ploioderma* spp.	Pines	Regionwide	Widespread because of wet spring; but impact slight, except in Christmas tree plantings in Georgia and South Carolina.
Oak leaf blister *Taphrina caerulescens*	Red oaks	Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, Texas	Scattered but not severe. Unsightly on urban trees.
Pine needle rust *Coleosporium* spp.	Pines	Regionwide	Premature needle cast may result; low impact.

Southern Region—Status of diseases in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Disease	Host	Location	Remarks
VASCULAR WILTS			
Dutch elm disease *Ceratocystis ulmi*	Elms	Throughout host range	Reported on scattered urban trees in North Carolina, Tennessee, and Louisiana.
Elm phloem necrosis (elm yellows), mycoplasmalike organism	Winged elm	Alabama	Continued to kill scattered urban trees.
Mimosa wilt *Fusarium oxysporum* f. sp. *perniciosum*	Mimosa	Throughout host range	Urban trees killed.
Oak wilt *Ceratocystis fagacearum*	Oaks	Arkansas, Kentucky, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia	Active infection centers increased in Virginia and Texas. Low incidence elsewhere.
Pinewood nematode *Bursaphelenchus xylophilus*	Japanese black pine	Georgia	Killing ornamental trees.
Sycamore leaf scorch xylem-limited bacteria	Sycamore	Florida, Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia	Widespread late in growing season.
NURSERY DISEASES			
Anthracnose *Gloeosporium* sp.	Yellow-poplar	Mississippi	Low-level, persistent problem.
Cylindrocladium root rot *Cylindrocladium* spp.	2-0 white pine	North Carolina	Caused 10 percent or more mortality in one field, involving over 100,000 seedlings, Edwards Nursery, Morganton.
	1-0 yellow-poplar, 1-0 black walnut		Caused 50 percent or more mortality in localized seedling beds.

Southern Region—Status of diseases in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Disease	Host	Location	Remarks
Damping-off *Fusarium* spp. *Phytophthora* spp. *Pythium* spp. *Rhizoctonia* spp.	Many conifers and hardwoods	Regionwide	Spotty, high incidence of postemergence damping-off in one South Carolina nursery; reduced seedbed density below desired levels. Chronic losses elsewhere.
Fusarium root rot *Fusarium* spp.	Loblolly pine	Arkansas, Texas	Persisted as a minor problem in poorly drained beds.
Fusiform rust *Cronartium quercuum* f. sp. *fusiforme*	Loblolly pine, slash pine	Regionwide, except Kentucky, Tennessee	Good control achieved with fungicide treatments.
Rhizoctonia needle blight *Rhizoctonia* sp.	Eastern white pine, loblolly pine, longleaf pine	Florida, North Carolina, South Carolina, Virginia	Caused widespread damping-off, stem and bud mortality, and foliage blight. Seemed to be more common in cool, wet areas.
Tip blight *Phoma* sp.	Loblolly pine	Florida, Georgia, Kentucky, Louisiana, North Carolina, South Carolina, Tennessee, Texas	Forking and brushing widespread east of the Mississippi River.
White grubs	2-0 Fraser fir	North Carolina	Caused 10 percent or more mortality in localized seedlings beds, Linville Nursery, Crossnore.
SEED ORCHARD DISEASES			
Pinewood nematode *Bursaphelenchus xylophilus*	Sand pine, slash pine	Florida	Killing trees in a sand pine orchard; incidental in a slash pine orchard.

Southern Region—Status of diseases in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Disease	Host	Location	Remarks
Pitch canker *Fusarium moniliforme* var. *subglutinans*	Southern pines, especially slash pine and loblolly pine	Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Texas	Orchards have sustained sporadic damage based on clone of host.
Root diseases *Armillaria* spp. *Armillaria tabescens* (=*Clitocybe tabescens*) *Heterobasidion annosum* *Inonotus circinatus* *Verticicladiella procera*	Eastern white pine, shortleaf pine	North Carolina, South Carolina	Low incidence, but chronic occurrence of symptoms and mortality in seed orchards.
Fusarium solani	Yellow-poplar	North Carolina	Severe infection has caused the loss of some clones. About one-third of the orchard is infected.
ABIOTIC Air pollution effects Ozone	Eastern white pine, other conifers	Georgia, Kentucky, North Carolina, South Carolina, Tennessee, Virginia	Tip burn damage to about 23 percent of white pine stands.
Unknown	Mixed hardwoods, conifers	North Carolina	Localized injury has occurred near a chemical waste disposal incinerator.
Storm damage	Many species	Alabama, Louisiana, North Carolina, Virginia	Old trees along the coast were most severely affected. Hurricanes Bob, Danny, Elena and Juan all caused severe local tree damage primarily in coastal areas.

Southern Region—Status of diseases in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia; and Puerto Rico and the Virgin Islands—Continued

Disease	Host	Location	Remarks
Winter damage	Many species	Regionwide	Tree mortality, branch dieback, and stem injuries resulted from record December 1984 cold. Ornamentals planted outside their natural range were most severely affected.
OTHER			
Oak decline	Oaks, especially the red oak group and chestnut oak	Regionwide	Severe decline and mortality have been widely reported for the past 5 years. The problem is most severe on upland sites on shallow soil over rock. Drought is a major contributing factor. Decline severity varies considerably from site to site.
Spruce/fir mortality	Fraser fir, red spruce	North Carolina, Tennessee, Virginia	The balsam woolly adelgid has been killing Fraser fir since it was introduced into that spruce/fir area more than 25 years ago. Recently, atmospheric deposition has been suggested as a possible contributing factor to reported spruce mortality and decline.
Tree decline	Many hardwoods, conifers	Regionwide, especially Georgia, North Carolina, South Carolina, Tennessee	Severe drought conditions have caused widespread growth reduction, dieback, and mortality, especially in older age classes. Recreation and urban areas are hardest hit. Other contributing factors in these high-use areas include soil compaction, vandalism to trees, and storm damage.

Eastern Region and Northeastern Area—Insects

Eastern Region and Northeastern Area—Status of insects in Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin

Insect	Host	Location	Remarks
Basswood thrips *Sericothrips tiliae*	Basswood	Minnesota, Wisconsin	In Minnesota, basswood defoliation varied from light to moderate on 500,000 acres of mixed northern hardwoods. Scattered mortality of understory trees is beginning to occur. In Wisconsin, light to moderate defoliation continued to occur in Sawyer, Rusk, and Washburn Counties. Activity is increasing in the northeastern part of the State.
Bruce spanworm *Operophtera bruceata*	American beech, oak, sugar maple	Maine, Michigan, New Hampshire, Pennsylvania, Vermont, Wisconsin	Populations of spanworm were evident in hardwood stands in central and northern Maine. But although light defoliation was seen on the ground, no defoliation was seen during aerial surveys. In the Upper Peninsula of Michigan, where this insect occurred with the fall cankerworm, small scattered areas of complete defoliation were noted in mixed hardwoods. In New Hampshire, populations caused some understory defoliation, but no defoliation was visible from the air. Populations are expected to remain low in 1986. In Pennsylvania, oak and maple defoliation was evident on 3,000 acres in Potter County—down from the 5,000 acres reported in 1984. A further decrease is expected in 1986. In Vermont, light defoliation was detected in Orleans and Washington Counties. In Wisconsin, an increase in moderate to heavy defoliation occurred on 30,000 acres in Forest, Florence, and Menominee Counties.
Fall cankerworm *Alsophila pometaria*	Hardwoods	Michigan, New York, Pennsylvania, West Virgina, Wisconsin	Nearly 100,000 acres of mixed hardwoods, predominantly oak and maple, were defoliated areawide this year. Michigan and Wisconsin reported building populations and heavy defoliation on almost 35,000 acres. In Pennsylvania, 65,000 acres were affected as populations continued to increase. Populations were down in New York and West Virginia.

Eastern Region and Northeastern Area—Status of insects in Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin—Continued

Insect	Host	Location	Remarks
Forest tent caterpillar *Malacosoma disstria*	Aspen, other hardwoods	Illinois, Maine, Michigan, Minnesota, New York, Pennsylvania, Vermont	Forest tent caterpillar populations were generally small. Minnesota reported about 15,500 acres of aspen defoliation in an area defoliated for 9 consecutive years. In Illinois, a 1,000-acre infestation that began in 1984 appeared to be declining. Maine, New York, and Vermont continued to evaluate poplar and sugar maple mortality caused by the 1978-82 outbreak.
Gypsy moth *Lymantria dispar*	Oaks, other hardwoods	Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia, Wisconsin	Moderate to heavy defoliation increased from 1 million acres in 1984 to 1.7 million acres in 1985—about a 70 percent increase. Pennsylvania, Massachusetts, and New Jersey recorded the most defoliation (1.2 million acres). Defoliation in Connecticut and Maryland also increased. In Michigan, defoliation increased to 18,460 acres. West Virginia and Maine reported continued expansion, but on a smaller scale. Defoliation decreased in Rhode Island (133,920 acres in 1985) and in Delaware (5,144 acres in 1985). No defoliation was visible during aerial surveys in Vermont and New Hampshire. Iowa, Illinois, Indiana, Minnesota, Missouri, and Wisconsin continued their detection and eradication programs. These States report male moth captures that range from 6 to 126 moths. Losses reported by Delaware, Maryland, and New Jersey totaled 44.5 million board feet of sawtimber and 46,300 cords of wood.

Eastern Region and Northeastern Area—Status of insects in Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin—Continued

Insect	Host	Location	Remarks
Jack pine budworm *Choristoneura pinus*	Jack pine	Michigan, Minnesota, Wisconsin	In Michigan's Upper Peninsula, populations continued to build: 2,380 acres of severe defoliation were mapped. This figure does not reflect a decrease in activity but rather a refinement in mapping accuracy. The 100,000 acres of moderate to heavy defoliation in northern lower Michigan is a significant decrease from the 600,000 reported in 1984 and further collapse is expected. In central Minnesota, a 45,000-acre infestation continued to intensify and expand. The 200,000-acre infestation in northeastern Minnesota also expanded in 1985, but population collapse is expected in the Virginia, MN, area where the budworm has been active for 4 years. The 30,000-acre infestation in northwestern Wisconsin is expected to continue its decline, but the fate of the 7,500-acre infestation in Jackson County is uncertain.
Saddled prominent *Heterocampa guttivitta*	Hardwoods	Maine, Michigan, Vermont	Populations remained low in Maine and Vermont, but appeared to be building in Michigan. Nearly 5,000 acres were defoliated in Michigan. Partial defoliation occurred on almost three sections of hardwoods in the Upper Peninsula's Marquette County. In the Lower Peninsula, 3,300 acres on the Sleeping Bear Dunes National Seashore and nearby offshore islands were defoliated. Populations are expected to increase.

Eastern Region and Northeastern Area—Status of insects in Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin—Continued

Insect	Host	Location	Remarks
Spruce budworm *Choristoneura fumiferana*	Balsam fir, spruce	Maine, Michigan, Minnesota, New Hampshire, New York, Vermont	Populations in Maine, New Hampshire, and Vermont declined for the second straight year. Maine reported 4.8 million acres infested with 1.2 million acres of moderate to severe defoliation. In 1984, Maine reported 5.5 million acres of defoliation, with 1.9 million acres of moderate to severe defoliation. An estimated 300,000 acres contain mortality of greater than 50 percent and an additional 700,000 acres contain scattered fir mortality of about 10 percent. Budworm populations in New Hampshire, New York, and Vermont are at or near endemic levels. New York reported 275 acres of light defoliation; New Hampshire and Vermont found no visible defoliation during aerial surveys. Further decline is expected. Vermont estimates spruce-fir mortality due to previous defoliation at 14,430 cords for 1985, a marked reduction from the 94,150 cords reported in 1984. In the Lake States, populations declined in the Upper Peninsula of Michigan and remained static in Minnesota and Wisconsin. Michigan, which had 93,810 acres of defoliation compared with almost 200,000 acres in 1984, expects further declines until endemic levels are reached within the next few years. Minnesota detected 307,273 acres of defoliation; nearly 260,000 acres were moderately to severely defoliated. This is a 15 percent reduction from 1984 and further declines overall are expected, even though populations in the extreme northeast will probably continue at high levels. Wisconsin reported 15,000 acres of severe defoliation.

Eastern Region and Northeastern Area—Diseases

Eastern Region and Northeastern Area—Status of diseases in Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin

Disease	Host	Location	Remarks
STEM AND BRANCH DISEASES			
Beech bark disease *Cryptococcus fagisuga*; *Nectria coccinea* var. *faginata*	American beech	New England, New Jersey, New York, Ohio, Pennsylvania, West Virginia	The distribution of this disease remained essentially the same as it was in 1984. Beech mortality continued in New England, New York, Pennsylvania, and greatly increased in West Virginia.
Diplodia blight *Sphaeropsis sapinea* (=*Diplodia pinea*)	Austrian pine, jack pine, red pine, Scotch pine	Indiana, Minnesota, Missouri, Rhode Island, Wisconsin	This disease occurs throughout Indiana, Missouri, and Rhode Island, where it is a perennial problem, particularly on Austrian pine. However, incidence and damage have been lower in the past 2 years. In Minnesota, 200 acres in Roseau County along the Canadian border are severely infected, resulting in 10 percent tree mortality and 60 percent moderate to heavy branch and top mortality. In Wisconsin, 5,000 acres of red and jack pines are affected. Survey results reveal an 8 percent infection rate and 1 percent tree mortality. No major spread is expected.
European larch canker *Lachnellula willkommii*	Larch	Maine	The area of the 6,500-acre infestation is clearly defined. An estimated 1,500 acres are heavily infested with both stem and branch cankers; the remaining 5,000 acres contain only branch cankers. A slow spread into the less dense, scattered stands of larch is expected. Cooperative surveys by Maine Forest Service, the Animal and Plant Health Inspection Service, and Forest Pest Management showed that approximately 22,867 acres of larch type exist in a 30-mile-wide coastal band. State and Federal quarantines are being implemented.

Eastern Region and Northeastern Area—Status of diseases in Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin—Continued

Disease	Host	Location	Remarks
Scleroderris canker *Gremmeniella abietina*	Eastern white pine, Jack pine, red pine, Scotch pine	Maine, Michigan, New York, Vermont, Wisconsin	The situation in Maine has stabilized at approximately 50 acres infected. No new sites have been found for several years, and no significant losses occurred in 1985. In Michigan, infections have been reported in association with frost pockets in Luce and Schoolcraft Counties where some mortality of 1- to 3-foot-tall trees has occurred. In New York, the area involved has not been determined, but Lewis County reported 1,500 acres of moderate infections and 500 acres of severe infections. Although the amount of infection declined in 1985, the course of the disease is uncertain. A quarantine remains in effect in New York. In a survey conducted in southern Vermont, no infected trees were found. However, the disease was found in previously uninfected areas in northern Vermont. A total of 122 plantations are known to be infected; the infected area involves 820 acres of red pine and 150 acres of Scotch pine. In Wisconsin, the disease has been reported from 11 counties. The incidence and severity appear to be remaining static.
White pine blister rust *Cronartium ribicola*	Eastern white pine	Maine, New York, Vermont, West Virginia	In Maine, this disease is under control on over 1.8 million acres in the *Ribes* eradication area. Little or no infection was found on lands that historically have had a continuing control program. In New York, the affected area is undetermined, but the disease appears to be on the increase. Vermont reports continued heavy damage causing some losses in young Christmas tree plantations. In West Virginia, almost 415,000 acres of State and private lands and an additional 145,000 acres of National Forest lands now fall within the *Ribes* control area.

Eastern Region and Northeastern Area—Status of diseases in Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin—Continued

Disease	Host	Location	Remarks
VASCULAR WILTS			
Dutch elm disease *Ceratocystis ulmi*	Elm	Areawide	Losses continue in Maine where only scattered, isolated trees remain unaffected. In Missouri, the disease is widespread, affecting both forest and urban trees, but losses were down slightly from 1984. This disease is a serious problem of both forest and shade trees in West Virginia, where losses were high in 1985.
Oak wilt *Ceratocystis fagacearum*	Oaks	Indiana, Iowa, Michigan, Minnesota, Missouri, Pennsylvania, Wisconsin	Oak wilt is widespread in Indiana, Iowa, and Missouri; infection levels are low to moderate and some tree mortality occurs each year. The situation is essentially static in these States, but continued losses are expected. In southwestern Pennsylvania, losses and incidence of the disease have been decreasing over the past few years. Michigan reported infections affecting almost 1,000 acres in Grand Traverse and Roscommon Counties. A smaller area of 30 acres in the Upper Peninsula's Menominee County is also infected. In Minnesota, the Twin Cities metropolitan area and southeastern portions of the State are affected. In Wisconsin, five counties in the southern two-thirds of the State are affected. The number of epicenters in Menominee and Shawano Counties increased from 11 to 55. In Michigan, Minnesota, and Wisconsin where oak wilt is expected to continue to be a serious problem, suppression activities include sanitation, salvage, chemical root graft barriers, and vibratory plowing of root grafts.

Eastern Region and Northeastern Area—Status of diseases in Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin—Continued

Disease	Host	Location	Remarks
ABIOTIC			
Weather-related injury	Various species	Iowa, Minnesota, Pennsylvania	April, May, and June in Iowa were the driest months on record and the State had only scattered rainfall the rest of the growing season. The seriousness of this Statewide drought cannot be determined until 1986. In northcentral Minnesota, winds damaged aspen and jack pine on 2,000 acres, causing estimated losses of 25,000 cords. In Pennsylvania, 21 tornadoes destroyed timber on 72,750 acres, causing losses estimated at $94 million. Salvage of approximately 50 percent of the damaged timber is anticipated.
OTHER			
Ash decline and mortality	Ash	Indiana, Iowa, New York, Vermont	Ash decline occurs throughout Indiana but especially in the northern third of the State. No mortality estimates are available, but the current level of decline is expected to continue in 1986. In northeastern and southwestern Iowa, seven counties are affected. Moderate infection levels seem to be increasing. In New York, 218,200 acres of moderate to heavy mortality were reported from Clinton, Jefferson, and St. Lawrence Counties. Dieback occurred Statewide. Dieback continued in Vermont and appeared to be increasing at upper elevations.
Birch decline	Paper birch, yellow birch	Michigan, New York, Vermont, Wisconsin	In Michigan, the most severe decline occurred on low, wet sites in Baraga and Iron Counties. The 1983 drought probably affected the decline. In New York, increasing decline has been reported from Lewis and Herkimer Counties. In Vermont, birch decline was more noticeable than usual, particularly in the Camel's Hump area. In northeastern Wisconsin, over 30,000 acres are affected. Twig and branch dieback, leaf wilting, and defoliation involving up to 60 percent of the tree crowns occurred.

Eastern Region and Northeastern Area—Status of diseases in Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin—Continued

Disease	Host	Location	Remarks
Hardwood decline	Hardwoods	Iowa, New Hampshire	In Iowa, moderate to heavy decline was found for the first time on shagbark hickory in five counties. New Hampshire reported 2.5 million acres of a hardwood decline affecting several northern hardwood species; red oak, sugar maple, and birch appeared to be the most severely affected. The areas with twig dieback often coincide with past defoliation by insects, such as the Bruce spanworm, the gypsy moth, and the saddled prominent. Other areas, however, have no history of defoliation. Corings taken in Coos County showed reduced radial growth that began 6 years ago.
Larch decline and mortality	Larch	Maine, New York, Vermont	In New York, this disease has been increasing; larch have been dying for the past 5 years. Some areas now have severe mortality. In Vermont, 544 acres of primarily light mortality were mapped in the northeast during the annual aerial survey. In Maine, mortality increased as larch beetle populations associated with the decline also increased.
Maple decline and mortality	Maple	New York, Pennsylvania, Vermont	In northern New York, decline of sugar maple has been a long-term problem. Heavily tapped trees on wet sites that have been grazed by cattle may be more susceptible. Moderate to severe red maple decline occurs with increasing severity on 130,000 acres in Herkimer and Lewis Counties; severe crown thinning and some tree mortality have occurred. In northern Pennsylvania, moderate to heavy sugar maple mortality was reported on 3,356 acres. This decline is related to past insect defoliation, particularly on marginal sites. In Vermont, maple decline increased this year, especially in the northern counties. Surveys found 8,400 acres of decline, 5,000 acres of which were unrelated to forest tent caterpillar.

Eastern Region and Northeastern Area—Status of diseases in Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin—Continued

Disease	Host	Location	Remarks
Oak decline and mortality	Oak	Iowa, Maryland, Missouri, New York	Oak decline occurred throughout Iowa; Bremer and Lucas Counties have moderate to severe damage, probably due to dry weather. In Maryland, dieback and mortality related to various stress factors occurred on scattered oaks throughout the State. The decline in Missouri is believed to be caused by drought, followed by secondary insect and disease agents. Scattered forest and ornamental oaks were affected in 1985 following the droughts of 1980, 1983, and 1984. In New York, oak decline has followed gypsy moth defoliation wherever it occurs. Root rot diseases and bark beetle attacks are common on trees that have been heavily defoliated. Mortality can be very high, and better quality oak seems to be more vulnerable.
Spruce decline and mortality	Spruce	New Hampshire, New York, Vermont	In New York, over 5.1 million acres are presently affected by red spruce decline. Moderate to heavy mortality has occurred on 326,000 acres of spruce-fir and mixed wood types in the northern part of the State. Fewer reports of new areas were received in 1985. Red spruce decline remained common in high-elevation sites, as well as on certain well-drained, lower elevation stands. Over 168,000 acres in New Hampshire and 50,000 acres in Vermont were reported to have moderate to heavy tree mortality. Permanent spruce decline monitoring plots were established in New Hampshire, New York, and Vermont by the USDA Forest Service in cooperation with the States. Spruce beetle, eastern dwarf mistletoe, and a variety of other factors were found to be associated with the mortality.